

vailing forces, such as the R&D of new generations of technology, that would obviate such concerns. If sector analyses show marked shifts in international trade patterns away from direct investment and toward management services and co-production agreements—in the absence of countervailing forces—medicinal measures must be considered. The exercise of preparing the sector analyses may itself serve as an effective early warning of technology erosion and would allow for timely adjustments before major economic disruptions and dislocations occur. These adjustments may take the form of (a) preventive controls (an extension of current export control procedures); or (b) positive reinforcement of fiscal measures and other incentives (or subsidies) to encourage innovation and its commercialization in the United States and to discourage U.S. technology assets from moving abroad to the detriment of U.S. employment (or at least remove any fiscal incentives for this).

2. There are at present no interagency mechanisms or procedures, aside from the East-West Export Control Board, to provide government agencies with an analysis of the economic impact of major technology transfer agreements. The East-West Export Control Board focuses its attention on the political and strategic dimensions of technology transfer, largely ignoring the longer-term economic effects, as outlined in this article. Even the narrow sampling of cases cited would indicate the need to re-examine interagency review of "major" technology transfer agreements and the need to develop a framework for evaluating the economic impact of these agreements. American firms applying for export licenses, or benefiting from government financing (through the Export-Import Bank or possibly through the Overseas Private Investment Corporation) should be subject to such review and be required to furnish necessary details on the technology transfer agreements.

*Foreign Policy No 25*  
*winter 76-77*

## DETECTING OUR DETERRENT

by Paul H. Nitze

During much of Henry Kissinger's dominance over U.S. foreign policy, détente with the Soviet Union was the centerpiece of that policy. U.S. military strength was viewed as necessary to make détente work, rather than to make possible actual defense of ourselves or our allies against Soviet military pressure; Kissinger said that war with the Soviet Union was unthinkable.

This view was supported by the proposition that any war between the Soviet Union and ourselves would be nuclear and would inevitably result in hundreds of millions of casualties on both sides. This, in turn, implied that it makes little difference, within limitations of the type contemplated by the Vladivostok accord, whether the Soviet side comes to have more or bigger offensive warheads, the degree to which they improve their weapons technology, the extent of the asymmetrically better Soviet defenses (both active and passive), or whether one side or the other strikes first, provided only that we maintain strategic offensive forces for retaliation approximately as numerous and powerful as those we now have and have programmed for the future.

No more serious question faces us than whether these propositions are true or false.

To assess their probable truth or falsity, three sets of considerations are pertinent: One has to do with the interaction of policy and military strategy; the second concerns the various methods of assessing relative capabilities; the third relates to the interaction between the perceived strategic balance and foreign policy, including détente.

### *Policy and Military Strategy*

Twenty years ago, I wrote the following: A strong case can be made that no rational



body of men would initiate a general atomic war unless they believed that the power of their initial attack and its immediate effects on the enemy would be so great as to assure that the subsequent phases of the war would be substantially one-sided. In order to achieve such a one-sided result, the attacking side (either Russia in an initial attack, or the West in response to an aggression by Russia or China which could be met only by general war) would logically concentrate the full power of its initial atomic attack on the military—primarily the retaliatory—capabilities of the other side. The attacker's object would be to destroy, in the initial blow, a large proportion of the base structure from which the defender must launch his retaliatory action (including the planes or missiles on the bases and the submarines and carriers which might support the main retaliatory action). The attacker would attempt to destroy a sufficiently large proportion of this base structure to reduce the power of the defender's retaliatory action to a level which the attacker's own defense system could contain. If he should succeed in this attempt he will have assured that the remaining phases of the war will be substantially one-sided. . . . The side which has lost effective control of the intercontinental air spaces will face a truly agonizing decision. It may still have the capability of destroying a few of the enemy's cities. But the damage it could inflict would be indecisive and out of all proportion to the annihilation which its own cities could expect to receive in return.<sup>1</sup>

Today some of the phrases in that passage seem out of date, but I believe the central points remain valid, particularly those which emphasize that the objective of military strategy under the circumstance of actual conflict would be to bring the war to an end under conditions less disastrous than other possible outcomes.

A much more succinct and elliptical formulation appeared in the November 1975 issue of *Communist of the Armed Forces*, the leading Soviet military publication:

<sup>1</sup> Paul H. Nitze, "Atoms, Strategy and Policy," *Foreign Affairs*, January 1956.

The premise of Marxism-Leninism on war as a continuation of policy by military means remains true in an atmosphere of fundamental changes in military matters. The attempt of certain bourgeois ideologists to prove that nuclear missile weapons leave war outside the framework of policy and that nuclear war moves beyond the control of policy, ceases to be an instrument of policy and does not constitute its continuation is theoretically incorrect and politically reactionary.

Implicit in this statement is the view that a war involving nuclear missiles should and can be an extension of policy. A suicidal war would not be an extension of policy; therefore Soviet military forces should not be limited in capability to that sufficient to assure mutual destruction.\* The force requirements for meeting the criterion of making war an extension of policy for one's own side are reasonably obvious, and include the following:

1. A powerful counterforce capability—one sufficient to reduce the enemy's offensive and defensive capabilities significantly and progressively below one's own;

2. Forces sufficiently hardened, dispersed, mobile, or defended as to make a possible counterforce response by the other side disadvantageous—that is, such that a counterforce response would only serve to weaken the relative position of the responder by using up a far higher percentage of his surviving forces than the percentage of the attacker's reserve forces he could hope to destroy;

3. Sufficient survivable reserve forces, whether or not there were such a counterforce response, to hold the enemy's population and industry disproportionately at risk;

4. Active and passive defense measures, including civil defense and hardened and dispersed command and control facilities, sufficient to ensure survival and control even if the enemy response to the initial counterforce attack were an immediate retaliatory strike on one's population and industry;

\* For 20 years, they accepted less than that!

1956-

an  
JSCPand  
US-SU  
conflict

Anticipation  
determine  
(if "li" still  
exists, as  
control...)  
(has other  
left...)

Nitze  
criticism



5. The means and the determination not to let the other side get in the first blow—i.e., to pre-empt if necessary. *pre-empt*

NO  
since  
1967  
(sub. since  
1973-75)  
"superiority"

An examination of the Soviet strategic nuclear program and their military doctrinal literature indicates that they are indeed attempting to achieve capabilities consistent with fulfilling all five requirements. One cannot, of course, prove or disprove judgments as to Soviet reasoning. But the programs begun about 1962 and continued at a high level of effort since that time seem to reflect a fundamental state of mind on the Soviet side that contains no doubt as to the desirability of a force which can meet this set of criteria.

#### Assessing Nuclear Capabilities

1964?  
Bogdan

That the Soviets are making rapid and significant progress in their strategic force programs is clear. But to assess the degree of Soviet progress in achieving these goals, to determine the truth or falsity of the judgments implied by Kissinger's policy statements, and to decide whether and to what extent U.S. strategic programs should be augmented or modified, the U.S. and Soviet relative nuclear capabilities must be assessed in detail and in a pertinent manner. Furthermore, it is important to illuminate the questions, how much is enough for the Soviet side to believe that a nuclear war could, for them, be an extension of policy through military means, and how much is enough for us to deny them that possibility.

There are three distinctly different ways, increasing in depth and sophistication, in which various indices, such as number of launchers (strategic nuclear delivery vehicles—SNDVs), number of warheads, megatonnage (EMT), countermilitary potential against hard targets (2,000 PSI—pounds per square inch—index), equivalent weapons or throw-weight, can be used to measure relative capabilities and crisis stability. These are:

1. That which each side has *before* a strike;

2. That surviving to the United States and that remaining to the Soviet side *after an initial counterforce strike by the Soviets*; *US*

3. That remaining to each side *after an exchange* in which the Soviet side attacks U.S. forces and the United States responds by reducing Soviet reserved forces to the greatest useful extent.<sup>2</sup>

The first method involves so-called "static" indicators. It does not assess how these capabilities might react upon each other in an actual exchange. It tends not to differentiate between those capabilities useful in a counterforce role and those useful in holding the other side's population and industry hostage.

The second method, being the first step in a dynamic analysis, is more sophisticated. It reflects the counterforce capabilities of those weapons used in the initial counterforce strike, but does not distinguish between the counterforce and the countervalue capabilities of the forces remaining to each side after that first step.

The third method, which carries the dynamic analysis a step further, most clearly brings out the stability or potential instability of the relationship by making it possible to assess the relative counterforce capabilities of each side and the countervalue capabilities remaining to each side after a two-sided counterforce exchange in which all useful counterforce targets have been addressed.

The following charts illustrate the results of one such set of analyses. Figure 1 illustrates the first method for several indices. Figure 2 illustrates the second. Figure 3 illustrates the third.

A word about the indices shown in these charts. In comparing the two disparate

<sup>2</sup> This third method of analysis was used in my article, "Assuring Nuclear Stability in an Era of Detente," published in Foreign Affairs, January 1976. This article deals with all three methods and concentrates on the policy issues implicit in relying on the second rather than the third method of analysis to determine force adequacy. In addition, I attempt to get at the question of how much is enough in a quantitative rather than only a qualitative way.



strategic forces, different indices are more significant in the different methods of analysis. In Figure 1, the most useful static index is the index of equivalent weapons (EW) of a strategic force (perhaps the most sophisticated single index, a measure which accounts for the number and yield of the warheads, the accuracy of those warheads, and the characteristics of the targets against which they might be used). In Figure 3, since the counterforce targets which it was considered useful to address have been addressed, the primary indices of interest are the countervalue ones. These include throw-weight (TW), which is the best overall measure of the countervalue potential of a strategic force;<sup>3</sup> total megatons, which is the best index of aggregate fallout effects; equivalent megatons, which is the best index of aggregate blast damage effects; and numbers of weapons, which is the best index of target coverage.

*usually ignored*

The calculations reflected in these charts are based on the assumption that U.S. forces would be on a normal alert status when attacked. Strategic warning generated by Soviet implementation of civil defense preparations, or by an evolving crisis situation, would enable the United States to bring additional forces, primarily a portion of the non-alert bomber forces, up to an alert status. Based on optimistic assumptions as to the additional forces that could be

<sup>3</sup> "Throw-weight" is a measure of the useful weight of payload that can be propelled to intended distance. In the case of intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs), the throw-weight is a direct measure of such useful weight in terms of the potential power of the missiles' boosters. In the case of the bombers, a B-52 has been assigned an equivalent throw-weight of 10,000 lbs. and a B-1 about 19,000 lbs. through the following calculations of equivalence: The air-to-surface short-range attack missile (SRAM) has a yield about equal to that of each of the three warheads that can be carried by a Minuteman III; hence, for every three SRAMs carried by a bomber, that bomber is given a throw-weight equivalent equal to the throw-weight of one Minuteman III. Laydown bombs are assumed to have roughly the yield of Minuteman II; hence, for each laydown bomb carried by a bomber it is given a throw-weight equivalent equal to the throw-weight of a Minuteman II.

brought up to alert, this could reduce the Soviet advantage after a counterforce exchange (as shown in Figure 3), by 20 per cent in number of warheads and 40 per cent in megatonnage. This result, however, is highly dependent upon the timely deployment of the B-1 force, which has not yet been finally approved. The effect of Soviet implementation of its evacuation program and other aspects of its civil defense program, which such strategic warning would permit, could be significantly more important in limiting its potential civilian casualties than the increase in numbers and megatonnage available to the United States as a result of having had such warning.

### BALANCE OF DEPLOYED FORCES (Static or pre-attack levels)

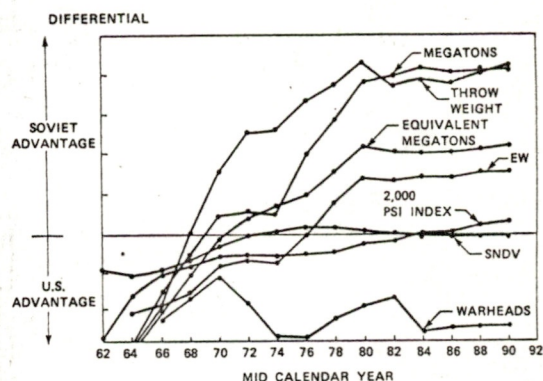


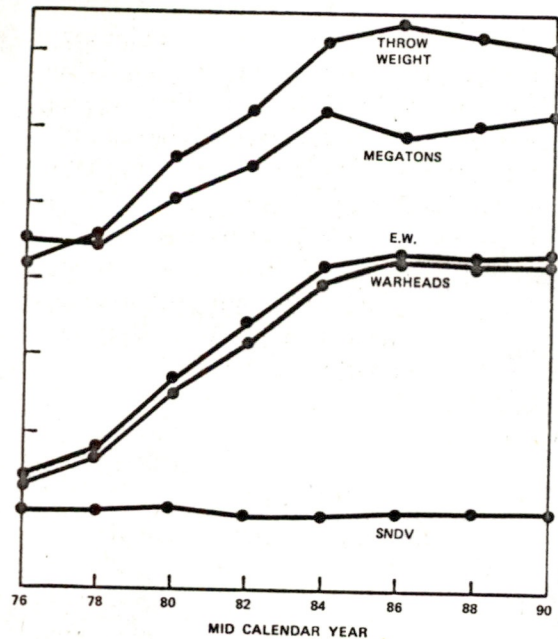
FIGURE 1.  
*NOT LOOKING AT US FS CAP!*

Trends shown in these charts by all methods and in all indices move in a direction favorable to the Soviet Union from the mid-1960s through the mid-1980s. Today, after a strategic nuclear counterforce exchange under normal U.S. alert conditions, the Soviet Union would hold superiority in all indices of capability except numbers of warheads, and even that sole remaining U.S. advantage would be gone within two or three years. Neither SALT I nor the projected SALT II agreements (assumed for the analyses shown) have had



## CAPABILITIES AFTER SOVIET FIRST STRIKE

### RED FORCES REMAINING



### BLUE FORCES SURVIVING

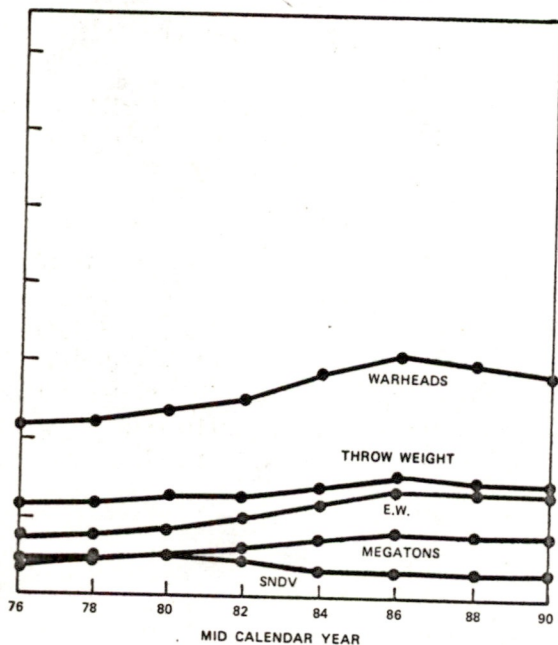


FIGURE 2.

## COMPARISON OF ALTERNATIVE INDICES OF CAPABILITY (After a counter force exchange)

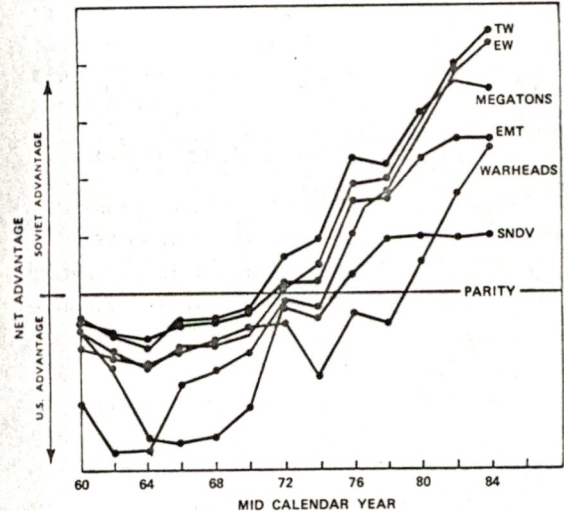


FIGURE 3.

## SOVIET - U.S. THROW-WEIGHT RATIOS

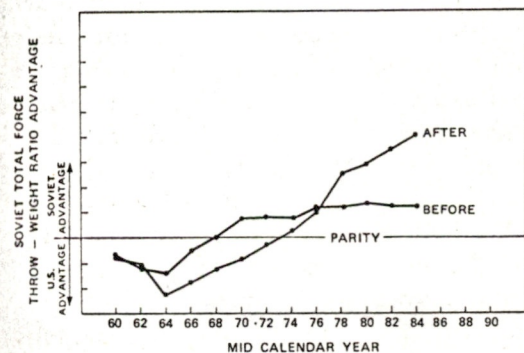


FIGURE 4.

—or promise—any discernible effect in arresting the trend toward an increasingly large margin of Soviet superiority. Moreover, the relationship is becoming unstable; the Soviets in coming years will be able to increase their ratio of advantage by attacking U.S. forces (the obverse, however, is not true). This is shown in Figure 4, where methods one and three (before-any-strike,



and after-a-counterforce-exchange) are compared for ratios of throw-weight. The point at which the curves cross indicates that point at which the Soviets could, by initiating such an exchange as postulated here, increase the ratio of advantage they held before the exchange.

### *U.S. Options and Soviet Civil Defense*

Does any of this make any difference? Isn't it true that we could, in the event of a Soviet counterforce attack, forgo a counterforce response and devote all of our surviving forces to an attack on Soviet population and industry? Wouldn't such an attack satisfy Kissinger's estimate of hundreds of millions of casualties on both sides? Isn't deterrence thereby assured?

It is desirable that the Soviet leadership should think so. It is, moreover, possible that a president, in the absence of all other options other than surrender, would make the decision, in the limited time which might be available to him for decision, to launch such a countervalue retaliatory attack. But is it desirable for a future president to be in the position of having no other useful option? Is this the high quality deterrence to which the United States is entitled and strove mightily over post-World War II decades to maintain? And would the Soviet leadership think it must lose hundreds of millions of citizens if the president were to make that decision?

I believe the answer to all these questions is negative.

Let me begin with the last question. The Soviet Union has for many years put emphasis upon the planning, organization, and training of cadres to implement a civil defense program. That program calls for the substantial evacuation of its cities and industrial plants, the sheltering of those who must stay, and the rapid construction of expedient fallout shelters by those who are evacuated and cannot otherwise be protected. In some of their civil defense manuals, the Soviets have estimated that the effective im-

plementation of this program should hold casualties to 3 per cent or 4 per cent of their population. This would be a large number of casualties, but not hundreds of millions, and not a number large enough to keep their society from being able to recover with reasonable speed. This goal may not be achievable; there are many uncertainties. However, it is possible to make some gross approximations of the possible effectiveness of Soviet civil defense.

The most difficult nuclear effect for a dispersed population to defend against is fallout. Fallout is proportional to the megatonnage and the fission fraction of the weapons which are ground burst. The United States has, over the last 15 years, substantially reduced the megatonnage of its weapons in favor of more numerous, smaller yield, more accurate warheads. Today our most survivable force is our Poseidon submarine force at sea; the aggregate megatonnage of its 2,000 or so normally alert reliable warheads is approximately 80 megatons. Because of their relatively low individual yield, it would be best to use them against point targets even in a countervalue attack, and they are most effective when fused for a height of burst optimum for blast damage effects; they would, however, then produce negligible fallout. Against such an attack the stated goal of the Soviet civil defense program might well be achieved.

Our alert bomber force is our next most survivable force. Its aggregate deliverable megatonnage could be 10 times as much as that of our alert SLBM force, but the alert bombers must be launched-on-warning and a prompt decision made as to the targets which they are to hit; otherwise their survivability would be little better than that of the non-alert bombers.

Of course, the Minuteman missiles with a megatonnage roughly equal to that of the alert bomber force could be launched from under attack, but to do so allows only minutes for the decision to be made. Rough computations indicate that if all these forces



were used in an all-out and immediate countervalue response to a Soviet counterforce first strike, the estimates in the Soviet civil defense manuals are overoptimistic from the Soviet viewpoint. They are not, however, wholly out of the ball park. The usual assumption that the United States possesses vast population overkill is, in essence, without foundation.

The crucial question is whether a future U.S. president should be left with only the option of deciding within minutes, or at most within two or three hours, to retaliate after a counterforce attack in a manner certain to result not only in military defeat for the United States but in wholly disproportionate and truly irremediable destruction to the American people. I believe not. This would be to make certain that military strategy had completely escaped from the control of policy.

#### U.S. vs. Soviet Defense Problems

Does any of this make any difference short of a nuclear war? The defense problems of the United States and the Soviet Union are quite different. The United States must be able to project its power over many thousands of miles to support allied defense structures on lines close to the concentrations of Soviet power. The Soviet basic defensive task is much simpler; that is, to maintain military preponderance on the exterior lines of its relatively compact land mass. Its only difficult problem is its long and narrow lines of communication to eastern Siberia. There can be little doubt that the Soviet Union has more than adequate military power for this basic defensive task.

For many years, U.S. strategic nuclear preponderance has made it possible to offset Soviet military superiority at the periphery and to deter its offensive employment. It has also made it possible for the United States confidently to use the seas for projection of its supporting power despite the Soviet Union's always very real sea denial capabilities.

i.e. US can operate offensively on the borders of the SU, thousands of miles from US.

(not only to defend NATO, with help of allies)

An imbalance in favor of the Soviet Union in the strategic nuclear relationship would reverse these factors.

There is a further problem, moreover, in that the Soviet Union has in recent years been paying increasing attention to projectible power, including air mobility, longer-range tactical air capabilities, intermediate-range missiles and projectible sea power. To counter such capabilities in the absence of confidence in the adequacy of our nuclear deterrent, could be difficult and imprudent. Not to counter them could leave us with wholly inadequate tools of policy.

#### Counterforce vs. Countervalue

What bearing does the foregoing analysis have upon the future design of our strategic forces? A clear distinction should be made between the counterforce and countervalue aspects of nuclear strategy. Neither can be ignored; both are essential to meaningful deterrence; but the requirements for each are different, distinguishable, and important.

In the past we have failed to appreciate this distinction and have thus fallen between two stools. We have prided ourselves on our advanced technology which has given us superior accuracy, higher yield-to-weight ratios in smaller yield re-entry vehicles (RVs), and leadership in developing multiple independently targeted re-entry vehicles (MIRVs). For political reasons and because of the presumed destabilizing nature of a counterforce capability, we have, however, forgone the accuracy and yield combinations which would give us high single-shot kill capabilities against Soviet silos and other hardened targets. On the other hand, in part to reduce the widespread destruction of a nuclear war, if it were to occur, we have progressively reduced the megatonnage of our force. This megatonnage is now so low that it is possible for the Soviet Union to plan a civil defense program which would make a far smaller percentage of their population hostage to a U.S. countervalue attack, particularly after

? No?  
(Congress should act, in 1970's)  
while pretty N to go on with MIRV + MX.



it has been reduced in capability by an initial Soviet counterforce attack, than our population is to a Soviet countervalue response.

② The Soviet leadership appears to be fully conscious of the differing requirements for countervalue and counterforce capabilities. The question has been asked why the Soviets continue to test high megatonnage single RVs on their SS-18s and SS-19s. I believe the answer is that they see the importance of deterring the deterrent; in other words, they wish to be able, after a counterforce attack, to maintain sufficient reserve megatonnage to hold U.S. population and industry hostage in a wholly asymmetrical relationship. Concurrently, the accuracy and yield combinations and numbers of MIRVED RVs they are deploying promise to meet their full requirements for a highly effective counterforce capability and still permit the withholding of a substantial number of missiles carrying large single RVs.

Our  
bombers

The question at issue is whether we also would be well advised to make a distinction between forces dedicated to a counterforce role and forces reserved for a countervalue role, and, if so, how much is enough in survivable forces for each of these two roles? My view is that we would be well advised to do so and that it is not impossible to find reasonable criteria to determine, within rough limits, how much is enough for each role. I would suggest two sets of criteria.

The first criterion would be to assure that the relationship of the yield, accuracy, survivability, and reliability of the two sides' forces is such that the Soviet side could not hope by initiating a counterforce exchange to improve either the absolute excess in pounds of its throw-weight over ours, or the ratio of its throw-weight to ours. To achieve this, it is necessary that we deploy forces which result in bringing the throw-weight line in Figure 3 closer to the parity line. This requires an increase in Minuteman survivability, through development of a new multiple-aim-point basing mode, an

RS  
for deterring?  
Ha!

Nitze

increase in Minuteman throw-weight, through development of the MX missile, and a substantial improvement in the single-shot kill probability of U.S. RVs against hard targets, through the development and deployment of missiles and RVs with the requisite combination of accuracy, yield, and reliability to give high probability of destroying some 1,500 to 2,000 hard targets. WHY?

STRIKING SECOND?!

The second criterion would be to assure that the forces remaining to the United States after a counterforce exchange would be fully adequate to keep the Soviet population hostage to a countervalue attack in the face of the most effective civil defense programs we judge it possible for the Soviet Union to mount. Something of the order of 3,000 deliverable megatons remaining in reserve after a counterforce exchange should satisfy the second criterion. not "400"

Rough computations indicate that we should be able to satisfy both criteria if we deploy 550 MX missiles in a multiple-aim-point mode, if we deploy the Trident II missile in an appropriate number of Trident submarines, if we develop their accuracy and reliability to the levels which now seem technologically feasible, and if we proceed with the planned B-1 deployments augmented with strategic cruise missiles. Such developments and deployments will, however, take time. In the meantime, in order to retain sufficient deterrence during the time required to restore a stable balance, urgent attention should be given to determining quick and possibly temporary fixes necessary to meet the problem as it is apt to emerge in the late 1970s and early 1980s. These include rapid development and deployment of a mobile transporter-erector-launcher and hardened capsule for Minuteman III, a variety of simplified point defenses of the class suggested by Richard Garwin<sup>4</sup> and others, provision for a poten-

<sup>4</sup>U.S., Congress, Testimony prepared for the Joint Committee on Defense Production, April 28, 1976.



tial rapid increase in bomber and SLBM alert rates and testing of reliable and appropriate methods to launch Minuteman from under verified large-scale attack against our silos.

*But it would!*  
The objective of such short- and long-range programs would not be to give the United States a war-fighting capability; it would be to deny to the Soviet Union the possibility of a successful war-fighting capability. We would thus be acting to maintain a situation in which each side is equally and securely deterred from initiating the use of nuclear weapons against the other or the allies of the other. It is only if, and when, we persuade the Soviet side that there is no reasonable prospect that they can successfully alter that situation that we can expect them seriously to negotiate for long-term agreements assuring stable mutual deterrence at lower and equal levels of strategic nuclear capabilities.

## HOW TO MAKE PEACE ON THE SEABED

by Jack N. Barkenbus

U.S. negotiators at the ongoing United Nations Law of the Sea Conference (UNCLOS) point to the negotiating deadlock on the creation of an international organization (the authority) to manage seabed resource exploitation beyond national limits as the major obstacle in concluding a comprehensive law of the sea treaty. The deadlock is essentially between northern and southern nations and centers upon control over the exploitation of the trillions of manganese nodules which litter the deep seabed floor and contain important mineral resources.

Development of the technology to mine manganese nodules is proceeding exclusively in the North, and these nations envision an authority with minimal supervisory capacities—leaving mining enterprises relatively free to determine where, when, and how to mine. The United States desires representation within the major decision-making organ of the authority (the council), commensurate with its mineral consuming/producing interests.

The South, however, viewing the nodules as the "common heritage of mankind" desires a strong regulatory body having a more diverse international character. This would basically entail: (a) giving the authority direct and effective control over all mining beyond national limits, and (b) ensuring that participation within the council be primarily determined on a geographical basis—thereby limiting the power of the United States and other northern nations.

The fifth and most recent UNCLOS session, which took place in New York and concluded in September, failed to resolve the split between the North and the South. In fact, tentative compromises on the seabed